

WHAT IS CLAIMED IS:

1. A heat conductive polishing pad for chemical-mechanical polishing comprising:

a polishing body including a thermoconductive polymer having a substrate with filler particles contained therein wherein said filler particles contain a Group II salt.

2. The heat conductive polishing pad as recited in Claim 1 wherein said polishing body further includes a base pad and said thermoconductive polymer forms a polishing surface located over said base pad and said thermoconductive polymer has a thermal conductivity of greater than about 1 Watts $m^{-1} K^{-1}$ and an electrical volume resistivity of greater than about 1×10^{15} ohm cm^{-1} at 25°C.

3. The heat conductive polishing pad as recited in Claim 1 wherein said substrate is selected from the group consisting of:

- polyurethane;
- polyolefin; and
- polyvinyl esters.

4. The heat conductive polishing pad as recited in Claim 1 wherein said substrate is selected from the group consisting of:

- polyurea;

4 polycarbonate;
5 aliphatic polyketone;
6 polysulfone;
7 aromatic polyketone;
8 6,6 nylon;
9 6,12 nylon; and
10 polyamide.

5. The heat conductive polishing pad as recited in Claim 1
2 wherein said substrate is selected from the group consisting of:
3 thermoplastic rubber; and
4 melt-processible rubber.

6. The heat conductive polishing pad as recited in Claim 1
2 wherein said substrate is selected from the group consisting of:
3 polypropylene;
4 polyethylene;
5 crosslinked polyethylene;
6 ethylene vinyl acetate; and
7 polyvinylacetate.

7. The heat conductive polishing pad as recited in Claim 1
2 wherein said thermoconductive polymer has a grafted compound
3 located substantially throughout said polymer.

8. The heat conductive polishing pad as recited in Claim 1
wherein said thermoconductive polymer has a modified surface and a
grafted surface on said modified surface, said grafted surface
comprising a grafted compound.

9. The heat conductive polishing pad as recited in Claim 7
wherein said grafted compound includes an inorganic metal oxide.

10. The heat conductive polishing pad as recited in Claim 8
wherein said grafted compound includes an inorganic metal oxide.

11. The heat conductive polishing pad as recited in Claim 7
wherein said thermoconductive polymer has a foam structure and said
grafted compound includes a controlled watability compound.

12. The heat conductive polishing pad as recited in Claim 8
wherein said thermoconductive polymer has a foam structure and said
grafted compound includes a controlled watability compound.

13. The heat conductive polishing pad as recited in Claim 7
wherein said grafted compound includes an organic compound.

14. The heat conductive polishing pad as recited in Claim 8
wherein said grafted compound includes an organic compound.

15. The heat conductive polishing pad as recited in Claim 1
2 wherein said Group II salt includes an anion selected from the
3 group consisting of:

4 Sulfate;

5 Stearate; and

6 Carbonate.

16. The heat conductive polishing pad as recited in Claim 1
2 wherein said Group II salt includes an anion comprised of oxide.

17. The heat conductive polishing pad as recited in Claim 1
2 wherein said Group II salt is Magnesium Oxide.

18. The heat conductive polishing pad as recited in Claim 1
2 wherein said Group II salt includes an anion comprised of
3 hydroxide.

19. The heat conductive polishing pad as recited in Claim 1
2 wherein said filler particles comprise at least about 20% by weight
3 of said thermoconductive polymer.

20. The heat conductive polishing pad as recited in Claim 1
2 wherein said filler particles have a spherical shape having an
3 average diameter of less than about 50 μ m to about 1 μ m.

21. The heat conductive polishing pad as recited in Claim 1
2 wherein said filler particles are incorporated substantially
3 throughout said substrate.

22. A method for preparing a heat conductive polishing pad
for chemical-mechanical polishing comprising:

providing a substrate;

blending filler particles containing a Group II salt into said
substrate to thereby produce a thermoconductive polymer; and

forming a polishing body from said thermoconductive polymer
suitable for polishing a semiconductor wafer or integrated circuit.

23. The method as recited in Claim 22 further including
extruding said thermoconductive polymer from an extrusion apparatus
to provide a thermoconductive foam for forming said polishing body.

24. The method as recited in Claim 22 wherein forming said
polishing body further comprises coupling a base pad under said
thermoconductive polymer and said thermoconductive polymer has a
thermal conductivity of greater than about 1 Watts $\text{m}^{-1} \text{K}^{-1}$ and an
electrical volume resistivity of greater than about $1 \times 10^{15} \text{ ohm cm}^{-1}$
at 25°C.

25. The method as recited in Claim 22 further comprising
exposing said polishing body to an initial plasma reactant to
produce a modified surface thereon; and
exposing said modified surface to a secondary plasma reactant
to create a grafted surface on said modified surface.

26. The method as recited in Claim 22 further comprising
2 exposing said polishing body to a precursor dissolved in a
3 supercritical fluid to thereby produce a modified polishing body.

27. The method as recited in Claim 22 wherein said blending
2 further comprises exposing said substrate to said filler particle
3 dissolved in a supercritical fluid to thereby produce said
4 thermoconductive polymer.

28. The method as recited in Claim 27 wherein said
2 supercritical fluid includes an initiator that includes sufficient
3 water such that said Group II salt includes an anion substantially
4 comprised of hydroxide.

29. A polishing apparatus comprising:

2 a mechanically driven carrier head;

3 a polishing platen, said carrier head being positionable
4 against said polishing platen to impart a polishing force against
5 said polishing platen; and

6 a polishing pad attached to said polishing platen and
7 including a polishing body comprising a thermoconductive polymer
8 having a substrate with filler particles contained therein wherein
9 said filler particles contain a Group II salt.

30. The polishing apparatus as recited in Claim 29 wherein
2 said Group II salt includes an anion comprised of hydroxide capable
3 of decomposing to oxide and water during chemical-mechanical
4 polishing.